Serial No. 10/601,030   Office Action Response
Attorney Docket No. RA-5482   October 12, 2005

Please amend the Claims as follows:

1   1.   (Amended) For use in a system having multiple processors <u>in a</u>
2   <u>processing node</u> coupled to a memory, a method, comprising:
3   a.) receiving multiple requests for data from the multiple processors;
4   b.) if ones of the multiple requests are requesting the same data, creating
5   a respective linked list to record the ones of the multiple requests; and
6   c.) issuing one of the requests recorded by each linked list <u>from the</u>
7   <u>processing node</u> to the memory.

1   2. (Original) The method of Claim 1, wherein each linked list orders requests in
2   order of receipt, and wherein the issued request is the oldest pending request.

1   3. (Original) The method of Claim 1, wherein the memory issues memory
2   requests to the multiple processors for the return of data to the memory, and if a
3   memory request is requesting the same data as requests recorded within a
4   linked list, adding the memory request to the linked list.

1   4. (Original) The method of Claim 1, and further including:
2   . receiving requested data from the memory;
3   if the received data was requested by requests recorded in a linked list,
4   providing the received data to a processor that issued a predetermined one of
5   the requests included in the linked list;
6   removing the predetermined request from the linked list; and
7   processing all requests remaining in the linked list.

1   5. (Original) The method of Claim 4, wherein the predetermined request is the
2   oldest-pending request in the linked list.

1   6. (Original) The method of Claim 4, wherein the processing step includes:

5

Serial No. 10/601,030   Office Action Response
Attorney Docket No. RA-5482   October 12, 2005

2   making the next request in the linked list the current request;

3   requesting return of the received data from whichever one of the multiple

4   processors last retained the data;

5   providing the received data to whichever one of the multiple processors is

6   indicated by the current request; and

7   removing the current request from the linked list.

1   7. (Original) The method of Claim 6, wherein the memory issues memory

2   requests to the multiple processors for the return of data to the memory, wherein

3   a memory request requesting the same data as requests recorded by a linked list

4   is added to the linked list, and wherein the providing step includes providing the

5   received data to the memory if the memory is indicated by the current request.

1   8. (Original) The method of Claim 7, wherein a shared cache is coupled to the

2   multiple processors, and further including:

3   attempting to retrieve the received data from the shared cache; and

4   if, in response to the requesting step, none of the multiple processors

5   returns the received data, the providing step includes providing any data

6   retrieved from the shared cache to whichever one of the multiple processors or

7   the memory is indicated by the current request.

1   9. (Original) The method of Claim 8, wherein if, in response to the requesting

2   step, none of the multiple processors returns the received data, and if the

3   received data is not resident in the shared cache, indicating the current request

4   must be retried.

1   10. (Original) The method of Claim 9, wherein the step of receiving requested

2   data from the memory occurs before all invalidation operations are completed for

3   the received data, and further including preventing predetermined data from

6

Serial No. 10/601,030   Office Action Response
Attorney Docket No. RA-5482   October 12, 2005

4   being provided to the memory until predetermined invalidation operations are

5   completed.

1   11. (Original) The method of Claim 6, wherein the requesting and providing steps

2   of Claim 6 are performed during an indivisible operation.

1   12. (Amended)   A method of processing requests from requesters to a

2   memory, including:

3   a.) receiving a request for data stored in the memory;

4   b.) if the request is requesting the same data as another pending request

5   that is already pending has not yet been provided from the requesters to the

6   memory, linking the request to the other pending request; and

7   c.) repeating steps a.) and b.) for any additional requests issued to the

8   memory.

1   13. (Original) The method of Claim 12, wherein steps a.) through .c) include

2   creating multiple linked lists of requests, each respectively associated with

3   different data.

1   14. (Amended)   The method of Claim 13, and further including:

2   d.) when data for the pending request is received from the memory,

3   providing the data to a requester that issued the pending request; and

4   e.) if the pending request is linked to a any other request, requesting that

5   the data be returned by a requester indicated by the pending request so that the

6   other linked request may be processed.

1   15. (Original) The method of Claim 14, and further including:

2   f.) providing the data to satisfy the linked request.

1   16. (Original) The method of Claim 15, and further including:

7

Serial No. 10/601,030   Office Action Response
Attorney Docket No. RA-5482   October 12, 2005

2   g.) making the linked request the current request;

3   h.) if the current request is linked to a request, requesting that the data be

4   returned by a requester that most recently retained the data;

5   i.) providing returned data to satisfy the linked request; and

6   j.) repeating steps g.) through i.) for any additional requests in the linked

7   list.

1   17. (Original) The method of Claim 16, wherein at least one of steps e.) and h.)

2   include requesting that the data is returned with predetermined access rights that

3   are based on a type of the current request and the linked request.

1   18. (Original) The method of Claim 16, wherein at least one of steps e.) and h.)

2   include requesting that the data is returned with predetermined access rights

3   based on rights that were granted by the memory for the data.

1   19. (Original) The method of Claim 16, wherein at least one of steps e.) and h.) is

2   performed in a manner that is determined programmably.

1   20. (Amended)   A system for processing requests to a memory, comprising:

2   multiple requesters to issue requests for data to the memory;

3   a request tracking circuit coupled to the multiple requesters to retain a

4   record of each request until the request is completed, and to associate a request

5   with any other one or more requests for the same data so that a single request

6   for any given data is pending provided from the multiple requesters to the

7   memory at a given time.

1   21. (Original) The system of Claim 20, wherein the request tracking circuit

2   includes a storage device to store multiple requests for the same data in a

3   respective linked list of requests.

8

1   22. (Original) The system of Claim 21, wherein the request tracking circuit
2   includes a control circuit to receive data from the memory, and to provide the
3   received data to one of the multiple requesters based on information stored
4   within the storage device.

1   23. (Original) The system of Claim 22, wherein if the received data is received in
2   response to a request that has been associated with other requests, the control
3   circuit provides the received data to whichever requester issued the oldest one of
4   the associated requests, and processes each of the other associated requests in
5   the order in which the other associated requests were recorded by the request
6   tracking circuit.

1   24. (Amended)   The system of Claim 23, wherein the control circuit includes
2   circuits to process each of the other associated requests by attempting to obtain
3   the received data from one of the multiple requesters, then providing any
4   obtained data to a requester that is ~~identifier~~ identified by the request that is
5   being processed.

1   25. (Original) The system of Claim 24, wherein the control circuit includes a
2   circuit to cause a requester to reissue a request if, during processing of a
3   request, data requested by the request could not be obtained.

1   26. (Original) The system of Claim 24, wherein the request tracking circuit
2   includes a remote tracker circuit to store a record of a request received from the
3   memory that is requesting that same data as one or more requests recorded
4   within the request tracking circuit.

1   27. (Original) The system of Claim 25, wherein the control circuit includes a
2   circuit to process the request from memory by attempting to obtain the requested
3   data, then providing any obtained data to the memory.

9

Serial No. 10/601,030   Office Action Response
Attorney Docket No. RA-5482   October 12, 2005

1   28. (Original) The system of Claim 23, wherein the memory provides data to the

2   request tracking circuit before all invalidation operations for the data have been

3   completed, and wherein the request tracking circuit includes a circuit to prevent

4   predetermined data retained by predetermined ones of the multiple requesters

5   from being returned to the memory before all of the invalidation operations are

6   completed.

1   29. (Amended)   A data processing system comprising:

2   a memory;

3   a processing node coupled to the memory and having one or more

4   requesters to ~~issue~~ generate requests for data to the memory, wherein the

5   processing node includes a requesting tracking circuit to record, in time-order,

6   requests issued for the same data, and to allow only one of the requests for the

7   same data from being issued to the memory at a given time.

1   30. (Original) The system of Claim 29, wherein the processing node includes

2   multiple processors, and wherein the requesting tracking circuit includes a control

3   circuit to receive data returned from the memory, the control circuit to provide the

4   data to the processor associated with the oldest request pending for the data.

1   31. (Original) The system of Claim 30, wherein the control circuit includes a

2   circuit to determine whether other requests are pending for the received data,

3   and for each of the other pending requests, attempting to obtain the data from

4   whichever of the multiple processors last retained the data, then providing any

5   obtained data to a processor that is associated with the request being processed.

1   32. (Original) The system of Claim 31, wherein the control circuit processes the

2   multiple requests for the received data in an order in which the multiple requests

3   were received.

Serial No. 10/601,030   Office Action Response
Attorney Docket No. RA-5482   October 12, 2005

1   33. (Original) The system of Claim 32, wherein the request tracking circuit

2   includes a control store to store programmable data to indicate the manner in

3   which the data is to be obtained from a processor based on access rights

4   retained by the processor for the data and the access rights requested by the

5   processor associated with the request being processed.

1   34. (Amended)   A system for processing requests to a memory, including:

2   processing means for ~~issuing~~ <u>originating</u> the requests to the memory; and

3   request tracking means for receiving the requests, and for forming an

4   association between any of the requests that are requesting the same data, and

5   for allowing only one of the associated requests to be ~~issued~~ <u>provided from the</u>

6   <u>processing means</u> to the memory.

1   35. (Original) The system of Claim 34, wherein the association records an order

2   of receipt of the requests that are requesting the same data.

1   36. (Original) The system of Claim 35, wherein the request tracking means

2   includes control means for receiving data from the memory, and if the received

3   data was requested by associated requests that are requesting the same data,

4   for processing each of the associated requests in the order in which the requests

5   were received.

                                        11

Serial No. 10/601,030   Office Action Response
Attorney Docket No. RA-5482   October 12, 2005

37. (Original) The system of Claim 36, wherein the control means includes means
for processing each request by obtaining the data with access rights required to
process the request, then providing the data to the processing means with the
required access rights.

12